PROJECT TITLE	:	INSTRUMENTATION AND PROCESS AUTOMATION
PERIOD COVERED	:	MARCH 23 - APRIL 22 1981
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1. Nitrate-Monitoring

In order to collect more information on short-term electrode stability, the main programme was slightly modified. A new graphic screen is now available which gives the response of the nitrate-sensor within the 60 seconds following the immersion of the module in the standard solution. This graph enables the operator to check that the preselected equilibrium time is suitable for the set of electrodes currently in use.

2. CO-NO Smoking Laboratory

The HP 9825 desk top computer used in this project works satisfactorily but electrical noises around the work places produce random stopping of the programme from time to time. Different levels of control and security have now been introduced in the sub-programmes involved in data acquisition. The different electrical lines and power supply will be protected and filtered if new problems are encountered within the next two months.

3. Automation of the Smoking Laboratory

The different output specifications of each instrument in the smoking laboratory are now being collected. Special attention is being given to the design and interfacing problems of the smoking machines. A set of programmes written in BASIC and in assembler is currently being tested for the multi-channel counters required for carrying out the puff-count. The number of electrical impulses received by each counter of the FILTRONA machine is now computed by software in order to reduce the amount of hardware required for each work place.

4. Instrumentation

The US PDI/DDI instruments of PMG (Berlin and Munich) have been serviced by our group. A new cigarette holder was fitted in the instruments and a new front panel was fixed to the main frame. A comparison between these two instruments was made using 30 cigarettes of each of two brands (BRD and NPF). The results obtained are presented in Table 1 and they correlate fairly well. A final test with the same calibration capillaries gave a difference of less than 0.4%.

Cigarettes	PDI/DDI Instruments			
(30 cig.)	PMG BERLIN		PMG MUNICH	
	RTD	Dilution %	RTD	Dilution %
BRD	$\bar{X}$ = 112.8 S = 5.44	$\bar{X}$ = 20.50 S = 2.01	$\bar{X}$ = 116.8 S = 5.19	$\bar{X}$ = 20.40 S = 1.89
NPF	$\bar{X}$ = 107.93 S = 3.89		$\bar{X}$ = 110.07 S = 3.46	

Table 1: Comparison of RTD and dilution data between two PDI/DDI instruments.

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